Understanding the coupling of surface, boundary layer, cloud and radiative processes in the Global Water and Energy Cycle

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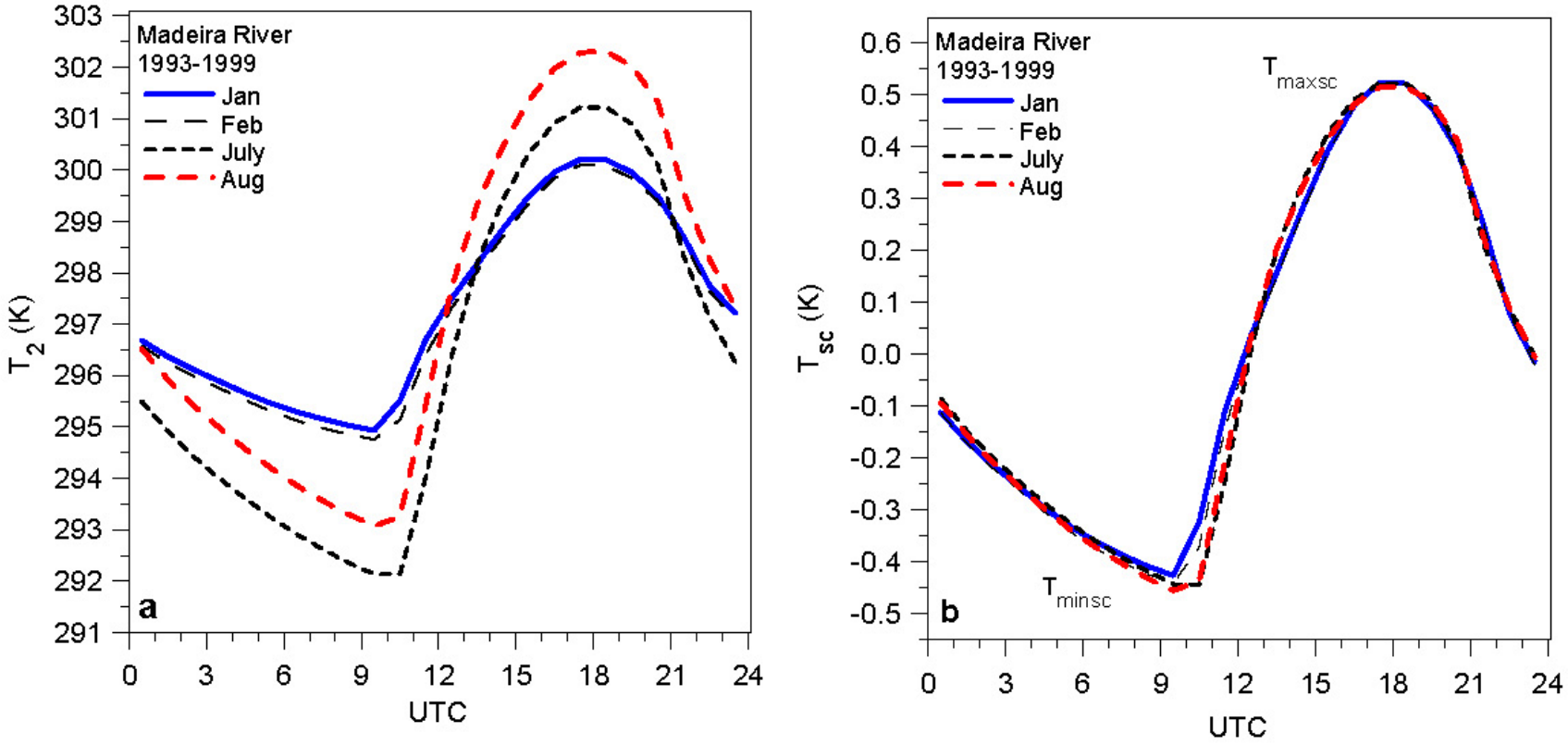
Long-wave radiation controls the diurnal temperature range and the strength of the nocturnal boundary layer



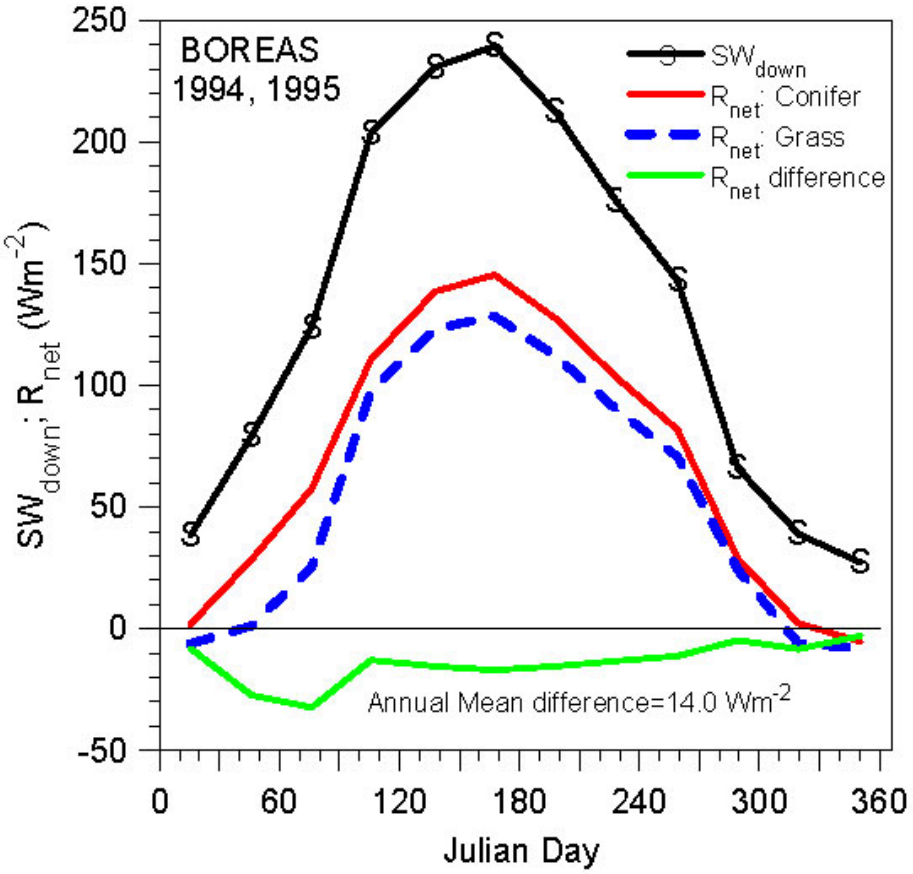
a) Seasonal variation of diurnal cycle over Amazon

b) A single curve when scaled by net LW radiation [*Betts, JGR, 2006]*

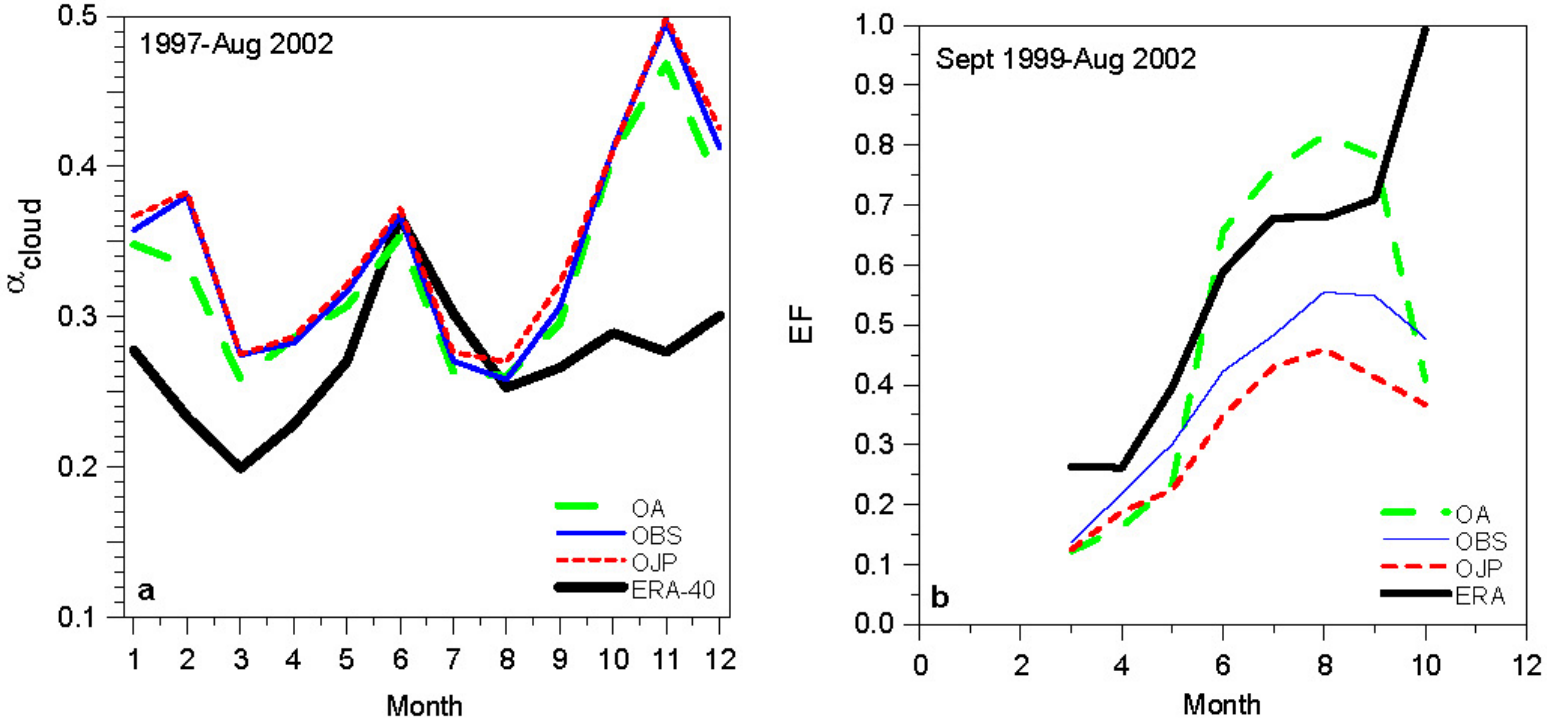
Land-surface interaction at northern latitudes differs over agricultural and forest regions

- Annual cycle of mean SW_{down}, R_{net} for conifer and grass sites and their difference
- Surface albedo [and the coupling to the cloud field] both change surface energy balance

[Betts et al., Ag. For. Met., 2006]



Assessing land-surface-atmosphere coupling in the ERA-40 reanalysis with boreal forest data.



a) Model bias in cloud albedo against BERMS forest sites
b) Bias in evaporative fraction *[Betts et al., Ag. For. Met., 2006b]*

Precipitation anomalies in ERA-40 NCEP-DOE and GPCP

Despite biases, seasonal anomalies are similar in reanalyses and GPCP precipitation

[Betts et al., JGR, 2006c]